

Finding the Time

Typically, high school is the hardest place to integrate a project-based learning approach. The issues for high school are many, including:

- Students are available for only an hour a day (except in block-scheduled schools).
- Teachers specialize in certain subject areas.
- Teachers feel pressured to prepare students for tests and college.

The hardest thing for high school teachers is the pressure they feel from end-of-course exams. They feel driven to “cover” the curriculum when they use traditional teaching methods, where instruction is often delivered through lecture with students taking notes and giving answers to questions. PBL changes this setting for instruction. Teachers assume a role of support, and students are led to discover information. Though it can seem time-consuming, it actually frees the teacher to work individually with students.

We have found a district that has been successful in bringing PBL into *all* of its schools. In the April 2004 PBL column, we talked about the Davidson County (North Carolina) School District’s initiative to implement PBL in 75% of its classrooms. (See “Taking the Plunge,” April 2004, pp. 34–36.) We explored the issues district leaders faced and gave some ideas to other administrators hoping to implement systemwide PBL initiatives. In this column, we look at how PBL is implemented in high schools throughout the district, using student examples to show the district’s success with PBL.

*By Diane McGrath
and Nancy Sands*

Subject: Integration of PBL into the high school curriculum

Grades: 9–12 (Ages 14–18)

Technology: Web authoring tools, digital video tools

Standards: NETS•S 3–6; NETS•T II; NETS•A II (<http://www.iste.org/standards/>)

PHOTO BY NANCY SANDS

High School Projects in a High-PBL District

Early Examples of High School PBL Projects

Davidson County began implementing its plan for all schools to engage in technology-enhanced PBL in the 2000–01 school year. One of the biggest successes in that first year was a high school class called Project-Based Web Authoring. This course is offered to expand and enrich students' education using state-of-the-art technologies. Learning is collaborative, hands on, and cross-curricular. Projects involve students creating Web sites in a fashion that ventures far past using a simple WYSIWYG editor. Students use real-world tools such as Macromedia's Dreamweaver, Fireworks, and Flash. The course also touches on the use of relational databases to create interactive Web sites and graphics handling and manipulation. The course is offered at the technology center, taking advantage of a fully equipped lab.

In this course, students have created Web sites that investigate such far-ranging topics as the 17th century witch hunts in the United States, ancient world civilizations, and Roman architecture. (*Editor's note:* Find URLs for these and other sites mentioned in this article under Resources on p. 55.) Witch Trials describes the history of the witch hunts and even compares them to McCarthyism in the 1950s. It includes a crossword puzzle to test your understanding of the events the students describe on the site. Ancient Civilizations gives descriptions of many ancient cultures, time lines, and interactive tasks, such as a picture puzzle that needs to be completed before you can figure out which civilization

it came from. The Roman Architecture project, completed by students in Ruth Hartsook's class, won first place in the 2002 Multimedia Mania award given by ISTE's HyperSIG. These students' work is phenomenal; they even wrote an original score for the background music on the Web site.

Later Projects

As a result of the professional development provided by the Enhancing Education Through Technology grant that began in 2002–03, a number of teachers in Grades 6–12 developed lesson plans, rubrics, checklists, and the associated essential (driving) question for at least one project and posted them on the grant page on the Web. These project samples give a good picture of the sorts of technology-infused projects that are possible at the high school level.

It is interesting to note that although the early projects we mentioned were from a technology course, these later projects were integrated into the curriculum. Science and English teachers in Davidson County were the earliest high school adopters of PBL.

Many of the high school-level projects required students to create a digital video in response to assigned reading or a concept covered in the course. Here, we focus on some from East High School. An AP English class read Oscar Wilde's *The Picture of Dorian Gray* and then summarized the book using iMovie. And AP Chemistry students had an option to create a commercial using iMovie or a children's book about one element from the periodic table.



One particularly interesting and successful project was in a ninth-grade honors English class. Students read *Fallen Angels* by Walter Dean Myers, a novel that discusses the Vietnam War. The students then produced a digital video about Vietnam, the war, the characters, and the culture.

Teacher Tabitha Broadway developed this six-week project, and she carried it out with the help and support of East High's media coordinator, Pam Grubb. One of the keys for successful PBL is this collaboration between someone with the technology skills and someone with the knowledge of how to teach English in a particularly meaningful way.

The original driving question for this project was: What was life like during the Vietnam War? The students read *Fallen Angels* and viewed the video *Dear America: Letters Home from Vietnam*. (This video is available from educational resellers and mass-market distributors.) They then began their research.

Students each interviewed one person who was at least 18 years old during the Vietnam War, asking questions about whether and why they supported or opposed the war, whether their opinion changed as the war went on, and what they remembered most about that period. They researched the health problems associated with participation in the war, the music soldiers listened to while in Vietnam, and the impact of racial conflict among soldiers. Students then created a handbook for modern soldiers, explaining 10 terms, phrases, places, or things from the book that would be unfamiliar to a new soldier in Vietnam.

An extension of the project focused on a second essential question: How do images and music stir a personal reaction to the text and historical time period? The library sponsored a contest in which groups of three students each created a short music

video using iMovie to incorporate still pictures taken by the students or borrowed from the Internet. The theme of the music video was to be one of the themes of the book. The students edited, made transitions, and added audio to their pictures. The project took five 90-minute class periods to complete, and students judged each other's projects. (See clips from the projects, left and on p. 53.)

Pam and Tabitha were excited by the learning gains the students exhibited after completing this project. According to Pam, "Students learned foremost that war is more than what they hear and see on the news. Through the research, students learned so many things about war, especially Vietnam, which they would have probably never learned. Through the video project, they learned that war involves real people and real lives, not just faceless soldiers."

"This was one of the most powerful assignments I have ever had my students complete, and working with the media coordinator really helped," added Tabitha. "The goals and objectives in the standard course of study do not change when a teacher uses PBL, it is just a better approach to teaching than traditional instruction. For example, our students are supposed to use literature to teach analytical skills, so the projects provide an opportunity to use those skills. At the end of the PBL unit, an exam was given with opportunities for essay and multiple choice questions. Students performed very well. My English I scores this year at East are the highest ever in ninth grade. Of course, this is a school achievement, not just in my classes, but I believe PBL was a contributor to our success."

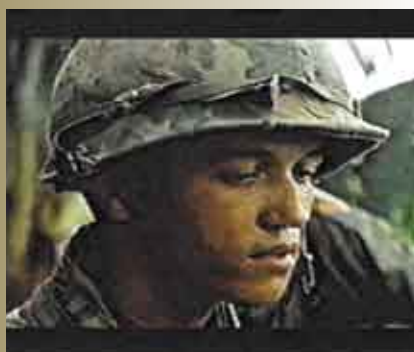
Tabitha discovered that PBL actually lightened the load. When the students were working on the video, they were so engaged in their work that she was freed up to work with students who needed individual help.

PBL Success in Your School or District

High-quality professional development into both the *why* and the *how* of technology-infused PBL, support at all levels of the school system, and collaboration among teachers and media specialists helped make these high school projects work.

When teachers first think about trying PBL using technology, their response is so often something like, "It's a nice idea in theory, but where am I going to get the time to learn how to do all this and to carry it out?" Although PBL can be time-consuming, Kevin Firquin, principal at Central Davidson Senior High School, helped his teachers get past that issue by asking every teacher to contribute to one major unit. Teachers responded with creative ideas to contribute to the schoolwide effort. For example, in an architecture class, students designed original structures that would serve as government buildings. Geometry teacher Londa Pickett helped students develop Web pages about famous buildings that used shapes to set mood, such as the round Hirshorn Museum. A 10th-grade English class read *Night* and wrote letters to the author, Elie Wiesel. They asked him how they could prevent events such as the Holocaust. His answer to them, in part, was, "Above all, a good citizen fights indifference, for indifference is worse than hatred."

Early projects began with school media coordinators working with individuals or teams of subject-area teachers. The media coordinators had been through many hours of PBL professional development, and 10 of them had been through Intel's Teach to the Future program that taught them how to assist the teachers. In addition to school media coordinators, the six district instructional technology specialists help teachers with specific pieces in their projects. When PBL is planned and implemented



with a team approach such as this one, the time for planning is reduced and student assignments are more quickly completed.

For example, a team of social studies teachers from Ledford High School used their Intel Teach to the Future training to develop a unit focusing on the French Revolution. The team was led by media coordinator Linda Kiger, who is an Intel Master Teacher. The first step for the teachers was to learn to develop the essential question that would provide an overarching theme for the study. The driving question they chose was: How was the French Revolution reflected in the European culture of the late 1700s? Designing this PBL unit with the North Carolina Standard Course of Study, each teacher researched music, art, literature, architecture, world events, and the history of France, including the French monarchy. After completing the research, teachers made PowerPoint presentations that served as models for students to emulate in their own presentations. This PBL unit was a much greater learning experience for students than one teacher working alone would have been able to orchestrate. Working with a team of teachers allowed their students to use an array of technology tools to construct materials and projects that encouraged creativity and higher order thinking skills. Using the team approach resulted in each teacher having ownership in the project and significantly reduced the time needed to create a unit.

Teachers who worked on these projects appear to be convinced: the team approach to a PBL project worked for them. It reduced their sense of anxiety about where the time would come from and whether they had the necessary skills. Their students, in turn, took enthusiastic ownership of their own projects and were successful in both the projects and the coursework. Teachers then could

heave a sigh of relief: they had enough time to teach and give individual help, and the PBL methods were a great way for their students to learn.

Tell us your stories about successful high school projects!

Resources

Diane McGrath's PBL Web site (<http://coe.ksu.edu/PBL/>) will take you directly to the Web resources discussed in this column, as well as resources mentioned in other columns. So check in early, and check in often.

Ancient Civilizations: <http://techcenter.davidson.k12.nc.us/fall026/>
 Davidson County Schools: <http://www.davidson.k12.nc.us>
 Enhancing Education Through Technology Grant—Projects and Lessons created by Davidson County Teachers: <http://www.davidson.k12.nc.us/pbl/eett/eett.htm>
 ISTE's HyperSIG: <http://www.iste.org/hypersig>
 Multimedia Mania: <http://www.iste.org/hypersig>
 Project-Based Learning in Davidson County Schools: <http://www.davidson.k12.nc.us/pbl/pbl.htm>
 Roman Architecture—Reconstructed: <http://techcenter.davidson.k12.nc.us/spring025/>
 Web Authoring Across the Curriculum—A Course for High School Students in Davidson County Schools, North Carolina: <http://techcenter.davidson.k12.nc.us/web.htm>
 Witch Trials: <http://techcenter.davidson.k12.nc.us/Group8/>



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